Los Alamos NATIONAL LABORATORY EST. 1943

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Meeting the Next Century's Challenges

Nuclear Nonproliferation (N) Division

The Nuclear Nonproliferation Division at Los Alamos National Laboratory works both on the front lines and behind the scenes to prevent the use of nuclear or radiological materials as threats to national or international security. N Division and its predecessors originated nuclear safeguards and created most of the technology used to monitor and measure nuclear materials to assure they are used for legitimate, peaceful purposes.

Radiation test object measurements at the Nevada Test Site DAF.

N-Division staff members

- have trained nearly every inspector working for the International Atomic Energy Agency (IAEA) in nondestructive assay techniques over the past 30 years;
- continue to use their hands-on experience with weapons-usable nuclear materials to advance new technical solutions to address ever-changing threat scenarios;
- support the international export control and nonproliferation regimes and provide technical input to the nation's policy leaders at the highest levels;
- analyze the potential technical and logistical capabilities of our nation's adversaries; and
- staff and equip the emergency teams that react to nuclear crises.

Throughout its more than 40-year history, N-Division has maintained a close technical connection with Los Alamos' nuclear weapons program, which has strengthened its fundamental capabilities in detecting and deterring proliferation. The approximately 250 members of N Division are proud of their rich scientific history and are committed to supporting nuclear nonproliferation and the national security of the United States.

A sphere of 59.6 kg of HEU and 6 kg of Np in a laboratory test stand

MISSION

- Provide capabilities to ensure global control of nuclear and radiological materials
- Lead next-generation domestic and international safeguards technology and personnel development
- Generate integrated systems approaches for threat prevention, detection and interdiction
- Provide tools for nuclear and radiological emergency response
- Anticipate/meet future national security challenges in deterring the proliferation of Weapons of Mass Effect (WME)

CAPABILITIES

- Radiation detection methodology development and testing
- Domestic and international nuclear safeguards
- Radiography
- Active interrogation
- Treaty and agreement implementation
- Trusted experts for IAEA
- Border control and detection
- Criticality experiments

Selected International Activities

- IAEA safeguards inspector NDA training
- Design, build, install NDA equipment for Rokkasho reprocessing plant, Japan
- Safeguards for Chernobyl spent fuel; Tomsk, Sarov, Beijing
- Securing Mayak Central Storage Facility
- UNARM software development
- Open source information analysis
- International Radiological Threat Reduction
- Kazakhstan spent fuel storage

Spent fuel verification in the UK

Emergency Response/Nuclear Counter-Terrorism

- Technology development, predictive research, threat definition
- Developing and providing specialized, hands-on technical and operational training for DOD, FBI and other agencies
- In-field technical support
- Triage technical support for rapid assessments
- Home-team reach-back support of field operations
- Exploring sensitive IND designs
- Attractiveness of nuclear fuel cycles
- Fissile material analysis
- Critical Experiments Facility at the Nevada Test Site

Future Areas of Strength

- Strengthen nonproliferation regime
- Detect:
  - clandestine facilities, materials, activities, testing
  - Special Nuclear Material (SNM) at a distance
  - Shielded HEU and plutonium in spent fuel
- Continue development of novel detectors/materials, ubiquitous sensors
- Unattended or remote monitoring systems
- Information extraction: threat indicators and signatures in data-rich environments
- Next-generation and advanced fuel cycle nuclear safeguards
- Large, highly-automated enrichment and reprocessing facilities that do not meet current IAEA diversion detection goals
- Arms control and disarmament verification (e.g., information barriers for measuring classified items)

N-Division's groups

Safeguards Science and Technology: Safeguards nuclear materials by developing nondestructive assay techniques and systems for nuclear materials control and accountability for domestic DOE nuclear facilities, nuclear waste disposal, material stabilization, and international nonproliferation. From conceptual research and physics through engineering finished instruments, the group develops equipment for active and passive analysis of nuclear materials neutrons, gamma rays or heat.

Advanced Nuclear Technology: Conducts research, development, training and operations in passive and active nuclear measurement techniques and radiography for nuclear emergency response, intelligence support, and international treaty verification. The group also operates the Critical Experiments Facility at the Nevada Test Site, which contains the largest collection of nuclear critical mass assembly machines in the western hemisphere. These assemblies can be broadly categorized as benchmark critical assemblies, general-purpose assemblies, and fast-burst assemblies.

International Threat Reduction: Leads the readiness and deployment of international nuclear monitoring and physical security systems and technology to reduce global nuclear proliferation threats. The group supports efforts to identify, prevent, convert, control, recover, and return radioactive sources and sources that contain special nuclear materials.

Safeguards and Security Systems: Uses its expertise in nuclear fuel cycle analysis, safeguards design, information management and other disciplines to develop and integrate safeguards hardware and software systems and security technologies to support U.S. government threat assessment and mitigation efforts, focusing on the complex interplay between technology and policy.

For more information contact the LANL Global Security Directorate's Nuclear Nonproliferation Division (505) 667-1212
http://www.lanl.gov/orgs/n/

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